

No.

9000065



THE UNITED STATES OF AMERICA

TO ALL TO WHOM THESE PRESENTS SHALL COME:

Golden's Foundation Seeds, Inc.

Whereas, THERE HAS BEEN PRESENTED TO THE

Secretary of Agriculture

AN APPLICATION REQUESTING A CERTIFICATE OF PROTECTION FOR AN ALLEGED NOVEL VARIETY OF SEXUALLY REPRODUCED PLANT, THE NAME AND DESCRIPTION OF WHICH ARE CONTAINED IN THE APPLICATION AND EXHIBITS, A COPY OF WHICH IS HEREUNTO ANNEXED AND MADE A PART HEREOF, AND THE VARIOUS REQUIREMENTS OF LAW IN SUCH CASES MADE AND PROVIDED HAVE BEEN COMPLIED WITH, AND THE TITLE THERETO IS, FROM THE RECORDS OF THE PLANT VARIETY PROTECTION OFFICE, IN THE APPLICANT(S) INDICATED IN THE SAID COPY, AND WHEREAS, UPON DUE EXAMINATION MADE, THE SAID APPLICANT(S) IS (ARE) ADJUDGED TO BE ENTITLED TO A CERTIFICATE OF PLANT VARIETY PROTECTION UNDER THE LAW.

NOW, THEREFORE, THIS CERTIFICATE OF PLANT VARIETY PROTECTION IS TO GRANT UNTO THE SAID APPLICANT(S) AND THE SUCCESSORS, HEIRS OR ASSIGNS OF THE SAID APPLICANT(S) FOR THE TERM OF *eighteen* YEARS FROM THE DATE OF THIS GRANT, SUBJECT TO THE PAYMENT OF THE REQUIRED FEES AND PERIODIC REPLENISHMENT OF VIABLE BASIC SEED OF THE VARIETY IN A PUBLIC REPOSITORY: AS PROVIDED BY LAW, THE RIGHT TO EXCLUDE OTHERS FROM SELLING THE VARIETY, OR OFFERING IT FOR SALE, OR REPRODUCING IT, IMPORTING IT, OR EXPORTING IT, OR USING IT IN PRODUCING A HYBRID OR DIFFERENT VARIETY THEREFROM, TO THE EXTENT PROVIDED BY THE PLANT VARIETY PROTECTION ACT (U.S.C. 1542, AS AMENDED, 7 U.S.C. 2321 ET SEQ.)

CORN

'LH163'

In Testimony Whereof, I have hereunto set my hand and caused the seal of the Plant Variety Protection Office to be affixed at the City of Washington, D. C. this *31st* day of *May* in the year of our Lord one thousand nine hundred and ninety-one.

Attest:

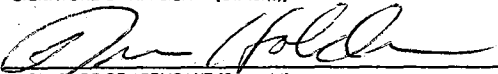
Kenneth H. Evans
Commissioner
Plant Variety Protection Office
Agricultural Marketing Service

Ed Madigan
Secretary of Agriculture

U.S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE

APPLICATION FOR PLANT VARIETY PROTECTION CERTIFICATE
(Instructions on reverse)

Application is required in order to determine if a plant variety protection certificate is to be issued (7 U.S.C. 2421). Information is held confidential until certificate is issued (7 U.S.C. 2426).

1. NAME OF APPLICANT(S) (as it is to appear on the Certificate) Holden's Foundation Seeds, Inc.		2. TEMPORARY DESIGNATION OR EXPERIMENTAL NO. Ex 1729	3. VARIETY NAME LH 163 JMS 5/31/91
4. ADDRESS (street and no. or R.F.D. no., city, state, and ZIP) P.O. Box 839 Williamsburg, Iowa 52361		5. PHONE (include area code) 319-668-1100	FOR OFFICIAL USE ONLY PVPO NUMBER 9000065 Filing Date Jan. 17, 1990 Time <input type="checkbox"/> A.M. <input checked="" type="checkbox"/> P.M. Filing and Examination Fee: \$ 2150.- Date Jan. 17, 1990 Certificate Fee: \$ 250.00 Date April 26, 1991
6. GENUS AND SPECIES NAME Zea mays	7. FAMILY NAME (Botanical) Gramineae		
8. CROP KIND NAME (Common Name) Corn, Field	9. DATE OF DETERMINATION March 1989		
10. IF THE APPLICANT NAMED IS NOT A "PERSON," GIVE FORM OF ORGANIZATION (Corporation, partnership, association, etc.) Corporation			
11. IF INCORPORATED, GIVE STATE OF INCORPORATION Iowa	12. DATE OF INCORPORATION 1968		
13. NAME AND ADDRESS OF APPLICANT REPRESENTATIVE(S), IF ANY, TO SERVE IN THIS APPLICATION AND RECEIVE ALL PAPERS Mr. Mark Armstrong P.O. Box 839 Williamsburg, Iowa 52361 319-668-1100 PHONE (include area code):			
14. CHECK APPROPRIATE BOX FOR EACH ATTACHMENT SUBMITTED (Follow INSTRUCTIONS on reverse) a. <input checked="" type="checkbox"/> Exhibit A, Origin and Breeding History of the Variety. b. <input checked="" type="checkbox"/> Exhibit B, Novelty Statement. c. <input checked="" type="checkbox"/> Exhibit C, Objective Description of Variety. d. <input checked="" type="checkbox"/> Exhibit D, Additional Description of Variety. e. <input checked="" type="checkbox"/> Exhibit E, Statement of the Basis of Applicant's Ownership. f. <input checked="" type="checkbox"/> Seed Sample (2,500 viable untreated seeds). Date Seed Sample mailed to Plant Variety Protection Office 1/12/90 g. <input checked="" type="checkbox"/> Filing and Examination Fee (\$2,150) made payable to "Treasurer of the United States."			
15. DOES THE APPLICANT(S) SPECIFY THAT SEED OF THIS VARIETY BE SOLD BY VARIETY NAME ONLY AS A CLASS OF CERTIFIED SEED? (See section 83(a) of the Plant Variety Protection Act.) <input type="checkbox"/> YES (If "YES," answer items 16 and 17 below) <input checked="" type="checkbox"/> NO (If "NO," skip to item 18 below)			
16. DOES THE APPLICANT(S) SPECIFY THAT THIS VARIETY BE LIMITED AS TO NUMBER OF GENERATIONS? <input type="checkbox"/> YES <input type="checkbox"/> NO		17. IF "YES" TO ITEM 16, WHICH CLASSES OF PRODUCTION BEYOND BREEDER SEED? <input type="checkbox"/> FOUNDATION <input type="checkbox"/> REGISTERED <input type="checkbox"/> CERTIFIED	
18. DID THE APPLICANT(S) PREVIOUSLY FILE FOR PROTECTION OF THE VARIETY IN THE U.S. <input type="checkbox"/> YES (If "YES," through <input type="checkbox"/> Plant Variety Protection Act <input type="checkbox"/> Patent Act. Give date: _____) <input checked="" type="checkbox"/> NO			
19. HAS THE VARIETY BEEN RELEASED, USED, OFFERED FOR SALE, OR MARKETED IN THE U.S. OR OTHER COUNTRIES? <input type="checkbox"/> YES (If "YES," give names of countries and dates) <input checked="" type="checkbox"/> NO			
20. The applicant(s) declare(s) that a viable sample of basic seeds of this variety will be furnished with the application and will be replenished upon request in accordance with such regulations as may be applicable. The undersigned applicant(s) is (are) the owner(s) of this sexually reproduced novel plant variety, and believe(s) that the variety is distinct, uniform, and stable as required in section 41, and is entitled to protection under the provisions of section 42 of the Plant Variety Protection Act. Applicant(s) is (are) informed that false representation herein can jeopardize protection and result in penalties.			
SIGNATURE OF APPLICANT (Owner(s)) 		CAPACITY OR TITLE President	DATE 1/12/90
SIGNATURE OF APPLICANT (Owner(s))		CAPACITY OR TITLE	DATE

Origin and Breeding History of the Inbred

Exhibit A

LH163 was developed by selfing hybrid plants from a population of Pioneer Hybrid variety 3720 and using the pedigree system of plant breeding. On the following pages are a summary and description of the development of LH163. Also included are copies of pages from Holden's Foundation Seeds, Inc. nursery books. The rows associated with the development of LH163 have been highlighted.

Attached is a statement from the originating plant breeder, Richard Miller, Holden's Foundation Seeds, Inc., stating that the line is stable, uniform and free of variance within the population.

Corn hybrid Pioneer 3720 was a long eared hybrid with weak root strength. Its area of adaptation was generally north and west in the corn belt. No record of the phenotypic traits or attributes of corn hybrid Pioneer 3720 can be found. The hybrid is evidently obsolete as it is no longer offered for sale in the marketplace. The origin of corn hybrid Pioneer 3720 is unknown since that information is considered a trade secret.

JMS 3/19/91
(from applicant
letter)

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Origin and Breeding History of the Inbred
LH163 = Ex1729 = Pioneer 3720

Exhibit A

<u>Row/Field</u>	<u>Pedigree</u>	<u>Location</u>	<u>Year</u>
Jones Farm	LH163	Iowa	1989
7493-7502	Ex1729	Iowa	1987
8709	Pioneer 3720 @7	Iowa	1986
14057	Pioneer 3720 @6	Iowa	1985
14382	Pioneer 3720 @5	Hawaii	1984-85
21307	Pioneer 3720 @4	Iowa	1984
16605	Pioneer 3720 @3	Hawaii	1983-84
12636	Pioneer 3720 @2	Iowa	1983
468	Pioneer 3720 @1	Hawaii	1982-83
13215	Pioneer 3720	Iowa	1981

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Uniformity Statement

Exhibit A

I have observed LH163 during the last two generations it has been increased, 1987 Iowa nursery rows 7493-7502 and 1989 Iowa production Jones Field. In both increases, seeds from the previous generation were planted. The line is very stable and uniform. The line is also free of variance from among and within the population.

A handwritten signature in cursive script, reading "Richard J. Miller". The signature is written in dark ink and is positioned above the printed name.

Richard J. Miller
Plant Breeder

Novelty Statement

Exhibit B

LH163 most closely resembles the corn inbred LH82. However, the most distinguishing characteristic is anther color. The anther color of LH163 is yellow, while the anther color of LH82 is pink.

LH163 is darker green in color than LH82. When using the Munsell Color Charts for Plants Tissues as a reference, LH163 would be classified as 5GY 3/4 and LH82 would be classified as 5GY 4/6.

OBJECTIVE DESCRIPTION OF VARIETY
CORN (ZEA MAYS)

NAME OF APPLICANT(S)

Holden's Foundation Seeds, Inc.

ADDRESS (Street and No. or R.F.D. No., City, State, and ZIP Code)

201 N. Maplewood Avenue
P.O. Box 839
Williamsburg, IA 52361

FOR OFFICIAL USE ONLY

PVPO NUMBER

9000065

VARIETY NAME OR TEMPORARY
DESIGNATION

LH163

Place the appropriate number that describes the varietal character of this variety in the boxes below.

Place a zero in first box (e.g., or) when number is either 99 or less or 9 or less.

1. TYPE:

1 = SWEET

2 = DENT

3 = FLINT

4 = FLOUR

5 = POP

6 = ORNAMENTAL

2. REGION WHERE BEST ADAPTED IN THE U.S.A.:

1 = NORTHWEST

2 = NORTHCENTRAL

3 = NORTHEAST

4 = SOUTHEAST

5 = SOUTHCENTRAL

6 = SOUTHWEST

7 = MOST REGIONS

3. MATURITY (In Region of Best Adaptability):

(Under "comments" (pg. 3) state how
heat units were calculated)

DAYS FROM EMERGENCE TO 50% OF PLANTS IN SILK

HEAT UNITS

DAYS FROM 50% SILK TO OPTIMUM EDIBLE QUALITY

HEAT UNITS

DAYS FROM 50% SILK TO HARVEST AT 25% KERNEL MOISTURE

HEAT UNITS

4. PLANT:

CM. HEIGHT (To tassel tip)

CM. EAR HEIGHT (To base of top ear)

CM. LENGTH OF TOP EAR INTERNODE

Number of Tillers:

1 = NONE

2 = 1-2

3 = 2-3

4 = > 3

Number of Ears Per Stalk:

1 = SINGLE 2 = SLIGHT TWO-EAR TENDENCY

3 = STRONG TWO-EAR TENDENCY 4 = THREE-EAR TENDENCY

Cytoplasm Type:

1 = NORMAL

2 = "T"

3 = "S"

4 = "C"

5 = OTHER (Specify)

5. LEAF (Field Corn Inbred Examples Given):

Color:

5GY 3/4 Munsell Color Charts for Plant Tissues

1 = LIGHT GREEN (HY)

2 = MEDIUM GREEN (WF9)

3 = DARK GREEN (B14)

4 = VERY DARK GREEN (K166)

Angle from Stalk (Upper half):

1 = < 30°

2 = 30-60°

3 = > 60°

Sheath Pubescence:

1 = LIGHT (W22)

2 = MEDIUM (WF9)

3 = HEAVY (OH26)

Marginal Waves:

1 = NONE (HY)

2 = FEW (WF9)

3 = MANY (OH7L)

Longitudinal Creases:

1 = ABSENT (OH51)

2 = FEW (OH56A)

3 = MANY (PA11)

Width:

CM. WIDEST POINT OF EAR NODE LEAF

Length:

CM. EAR NODE LEAF

NUMBER OF LEAVES PER MATURE PLANT

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6. TASSEL:

0 6

NUMBER OF LATERAL BRANCHES

Branch Angle from Central Spike:

2

1 = $< 30^\circ$ 2 = $30-40^\circ$ 3 = $> 45^\circ$

Penduncle Length:

0 2

CM. FROM TOP LEAF TO BASAL BRANCHES

Pollen Shed:

2

1 = LIGHT (WF9)

2 = MEDIUM

3 = HEAVY (KY21)

1

Anther Color:

1 = YELLOW

2 = PINK

3 = RED

4 = PURPLE

5 = GREEN

6

Glume Color:

6 = OTHER (Specify)

green with brown margin

Pollen Restoration for Cytoplasm (o = Not Tested, 1 = Partial, 2 = Good)

0

"T"

0

"S"

0

"C"

0

OTHER (Specify Cytoplasm and degrees of restoration)

7. EAR (Husked Ear Data Except When Stated Otherwise):

1 9

CM LENGTH

4 0

MM. MID-POINT
DIAMETER

1 0 7

GM. WEIGHT

Kernel Rows:

2

1 = INDISTINCT

2 = DISTINCT

1 4

NUMBER

1

1 = STRAIGHT

2 = SLIGHTLY CURVED

3 = SPIRAL

Silk Color (Exposed at Silking Stage):

1

1 = GREEN

2 = PINK

3 = SALMON

4 = RED

Husk Color:

1

FRESH

1 = LIGHT GREEN

2 = DARK GREEN

3 = PINK

6

DRY

4 = RED

5 = PURPLE

6 = BUFF

Husk Extention: (Harvest Stage)

1

1 = SHORT (Ears Exposed) 2 = MEDIUM (Barely Covering Ear)
3 = LONG (8-10CM Beyond Ear Tip)
4 = VERY LONG (> 10 CM)

Husk Leaf:

1

1 = SHORT (< 8 CM) 2 = MEDIUM (8-15 CM)
3 = LONG (> 15 CM)

Shank:

0 9

CM LONG

7

NO. OF INTERNODES

Position at Dry Husk Stage:

1

1 = UPRIGHT

2 = HORIZONTAL

3 = PENDENT

Taper:

2

1 = SLIGHT

2 = AVERAGE

3 = EXTREME

Drying Time (Unhusked Ear):

2

1 = SLOW

2 = AVERAGE

3 = FAST

8. KERNEL (Dried):

Size (From Ear Mid-Point):

1 0

MM LONG

0 8

MM. WIDE

0 5

MM. THICK

Shape Grade (% Rounds)

5

1 = < 20

2 = 20-40

3 = 40-60

4 = 60-80

5 = > 80

8. KERNEL (Dried) :

Pericarp Color: 1 = COLORLESS 2 = RED-WHITE CROWN 3 = TAN 4 = BRONZE
5 = BROWN 6 = LIGHT RED 7 = CHERRY RED
8 = VARIEGATED (Describe) colorless at crown then turns more bronze in color down to pedicel

Aleurone Color: 1 = HOMOZYGOUS 2 = SEGREGATING (Describe) _____

1 = WHITE 2 = PINK 3 = TAN 4 = BROWN 5 = BRONZE 6 = RED
7 = PURPLE 8 = PALE PURPLE 9 = VARIEGATED (Describe) _____

Endosperm Color: 1 = WHITE 2 = PALE YELLOW 3 = YELLOW 4 = PINK-ORANGE 5 = WHITE CAP.

Endosperm Type:

1 = SWEET (su1) 2 = EXTRA SWEET (sh2) 3 = NORMAL STARCH 4 = HIGH AMYLOSE STARCH
5 = WAXY STARCH 6 = HIGH PROTEIN 7 = HIGH LYSINE 8 = OTHER (Specify) _____

GM. WEIGHT /100 SEEDS (Unsize Sample)

9. COB:

MM. DIAMETER AT MID-POINT

Strength:

1 = WEAK 2 = STRONG

Color:

1 = WHITE 2 = PINK 3 = RED 4 = BROWN
5 = VARIEGATED 6 OTHER (Specify) _____

10. DISEASE RESISTANCE (0 = Not Tested, 1 = Susceptible, 2 = Resistant):

STALK ROT (Diplodia) STALK ROT (Fusarium) STALK ROT (Gibberella)
 NORTHERN LEAF BLIGHT SOUTHERN LEAF BLIGHT SMUT
 SOUTHERN RUST CORN SMUT BACTERIAL WILT
 BACTERIAL LEAF BLIGHT MAIZE DWARF MOSAIC STUNT
 OTHER (Specify) _____

11. INSECT RESISTANCE (0 = Not Tested, 1 = Susceptible, 2 = Resistant):

CORNBORER EARWORM SAPBEETLE APHID
 ROOTWORM (Northern) ROOTWORM (Western)
 ROOTWORM (Southern) OTHER (Specify) _____

12. VARIETIES MOST CLOSELY RESEMBLING THAT SUBMITTED FOR THE CHARACTERS GIVEN:

CHARACTER	VARIETY	CHARACTER	VARIETY
Maturity	LH82	Kernel Type	A632Ht
Plant Type	LH82	Quality (Edible)	
Ear Type	A632Ht	Usage	LH82

REFERENCES:

U.S. Department Agriculture. Yearbook 1937.

Corn: Culture, Processing, Products. 1970 Avi Publishing Company, Westport, Connecticut. (Numerous Authors)

Emerson, R.A., G.W. Beadle, and A.C. Fraser. A Summary of Linkage Studies in Maize. Cornell A.E.S., Mem. 180. 1935.

The Mutants of Maize. 1968. Crop Science Society of America. Madison, Wisconsin.

Stringfield, G.H. Maize Inbred Lines of Ohio. Ohio A.E.S. Bul. 831. 1959.

Butler, D.R. 1954 - A System for the Classification of Corn Inbred Lines - PhD. Thesis, Ohio State University.

COMMENTS:

$$GDD = \frac{T_{max} + T_{min}}{2} = 50^{\circ}F$$

$$T_{max} \leq 86^{\circ}F$$

$$T_{min} \geq 50^{\circ}F$$

Additional Description of the Inbred

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Exhibit D

LH163 is most similar to LH82, but LH163 does possess a number of characteristics which distinguish it from LH82.

LH163 is darker green in color than LH82. When using the Munsell Color Chart for Plant Tissues as a reference, LH163 would be classified as 5GY 3/4 and LH82 would be classified as 5GY 4/6.

The leaves of LH163 have a noticeable characteristic which can be seen on the following page. The outer margins of the leaves roll longitudinally under the midrib. This is a distinguishing trait because most other corn inbreds, LH82 included, have leaves which have a flat appearance where the margins do not roll under the midrib.

LH163 reaches mid pollen 3 days earlier than LH82. At Williamsburg, Iowa, during the growing season of 1989, LH163 reaches mid pollen in 73 days or 1255 growing degree day units. LH82 reached mid silk in 76 days or 1314 growing degree day units.

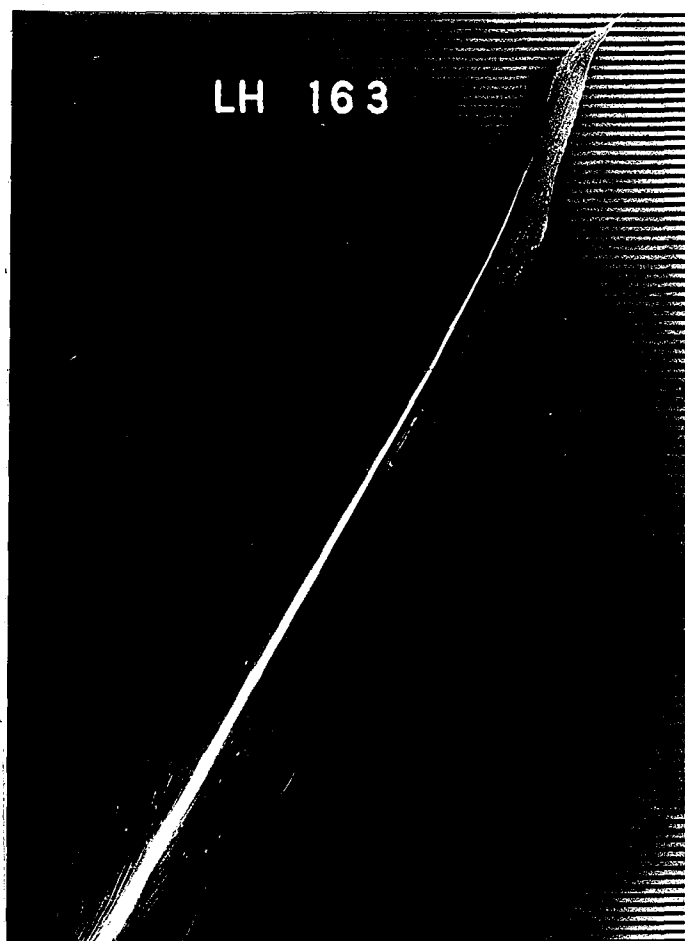
The anther color of LH163 is yellow while the anther color of LH82 is pink.

The husk of LH163 does not cover the tip of the ear which leaves the tip of the ear exposed. This trait may also be partially responsible for the excellent silking ability of LH163. LH163 silks very uniformly and the length of the silk is very long for an inbred. A photograph of the exposed ear of LH163 is on the following page.

The ear of LH163 averages 14 kernel rows while LH82 averages 22 kernel rows per ear. The kernel of LH163 is not as long as the kernel of LH82 (10 mm vs 11 mm) but the kernel of LH163 is wider (8 mm vs. 7 mm) and thicker (5 mm vs. 3 mm) than the kernel of LH82.

LH163 contributes good stress tolerance and root strength to hybrids. LH163 appears to have good general combining ability due to the fact it combines well with both stiff stalk and non stiff stalk lines. Though we have only limited experience with LH163 in production situations, we think it will be an adequate large seeded female.

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JMS
3/19/91

~~Novelty Statement~~

Exhibit B D

LH163 most closely resembles the corn inbred line LH82. However, the most distinguishing characteristic is the tassel. The tassel of LH163 has a lateral branch angle of 30° - 40° while the tassel of LH82 has a lateral branch angle of less than 30° . A photograph of the tassel of each inbred is below showing the difference in tassel branch angle of the two inbreds.

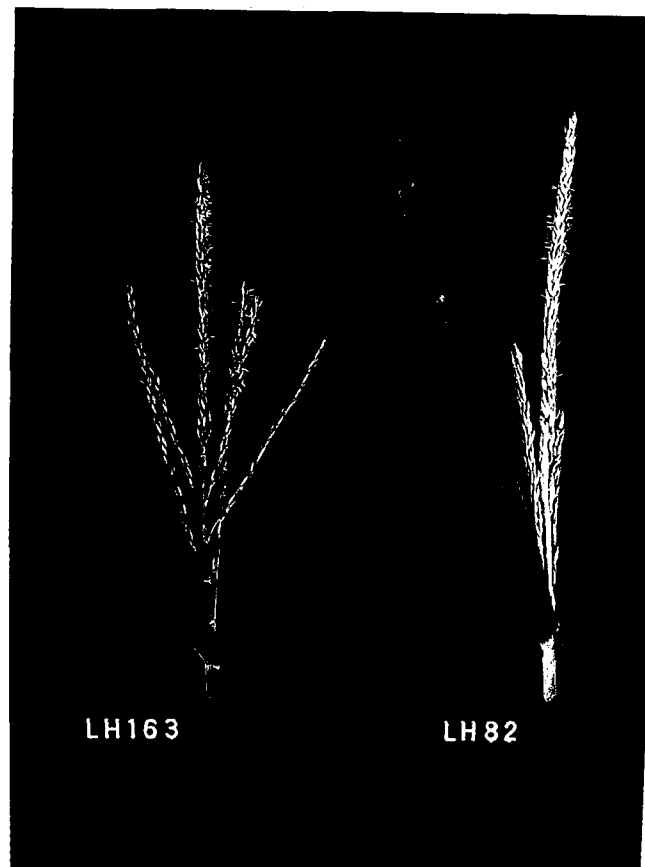


Exhibit E

STATEMENT OF THE BASIS OF APPLICANT OWNERSHIP

Holden's Foundation Seeds, Inc., Williamsburg, Iowa, is the sole owner and breeder of the LH163 corn inbred line for which it solicits a certificate of protection.